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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/866,399

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Yunnan Wu

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12/29/2004

Patent Department

Mitsubishi Electric Research Laboratories, Inc.

201 Broadway

Cambridge, MA 02139

EXAMINER

GREY, CHRISTOPHER

ART UNIT

PAPER NUMBER

2667

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/866,399

Applicant(s)

WU ET AL.

Examiner

Christopher P Grey

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:  
Grammatical error: Page 7 line 5, "though".  
Grammatical error: Page 7 lines 13-14, "can include one or relays 103".  
Grammatical error: Page 9 lines 7-8, "The queue occupancy reflects the amount space in the queue is used".  
Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 8, 9, 12, 13, 14, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Waclawsky et al. (US 5226041)

Claim 1 and 16 Waclawsky et al. ('Waclawsky' hereinafter) discloses a method/system within a data communications network that sends a plurality of data packets from a sending node (sender end system) to a destination node (receiver end system). Before the packets reach the destination node, they experience an intermediate node (see Figs 1 A-M) having a queue. The queue outputs the data

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packets and queue size information (queue occupancy). The destination node sends a marker (feedback) to the sending node to indicate the receipt of the data packets. The method also discloses the computation of the time duration to transmit the data packets from the sending node to the destination node, and also the transit time for sending the marker from the destination node to the sending node. These transit times are recorded in a data processor and updated for each cycle. Waclawsky discloses sending a second window's worth of data packets with a size dependant on queue size information (predicted queue occupancy) (disclosed in Col 1 line 60- Col 2 line 33).

Claim 4 Waclawsky discloses a cycle time duration that is equal to the time of receipt of a second marker (feedback) – time of receipt of a first marker (Col 4 lines 40-44). Waclawsky also discloses capturing a time duration of a first and second cycle, necessary to transmit a packet from the sender node to the receiver node (Col 2 lines 14-52). These cycle duration times are stored in a data processor.

Claim 8 Waclawsky discloses an origin node connected to a destination node via an intermediate node (relay), with a link (element 32) from the origin to the intermediate and a link (element 36) from the intermediate to the destination (See figs 1 A-M).

Claim 9 After the first cycle the origin node (sender) determines the size of the queue (queue occupancy) as denoted by Q1 in Figs 1 A-M. The intermediate node determines a threshold V2, where V2=1 represents exceeding the threshold (fullness) of the intermediate node. Q2 within the intermediate node depicts a second queue size (queue occupancy) that is related to a second link (element 36) (disclosed in Col 5 line 52- Col 6 line 25).

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Claim 12 Waclawsky discloses within the intermediate node (relay), denoting the size of a second queue (queue occupancy) and a threshold value (traffic management). Waclawsky also discloses when a threshold value has been exceeded, decrementing (content adaptation) the current window size (disclosed in Col 6 lines 8-25).

Claim 13 Waclawsky discloses in Figs 1 A-M a loop existing from the origin to the intermediate node via element 32 and from the intermediate node back to the origin via element 40. This loop is dependant/controlled by a threshold value. Waclawsky also discloses a control loop from the intermediate node to the destination node via element 36, and from the destination node to the intermediate node via element 38 and the origin node, where once again threshold is used as a control.

Claim 14 Waclawsky discloses decrementing (content adaptation/withdrawal) the current size of the window when a threshold value is exceeded (Col 6 lines 8-25).

Claim 15 Waclawsky discloses decrementing (withdrawal/update) the current size of the current window (number of bits). This takes place in the window generator, which is contained within the origin (Col 6 lines 8-25).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 6, 7, 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waclawsky et al. (US 5226041) in view of Li et al. (US 6741555)

Claim 2 Waclawsky discloses incrementing the window size (sending the next packet) by one packet when the maximum queue size is equal to 0 (disclosed in Col 5 lines 15-34). Waclawsky also discloses a second window's worth of data packets being sent in response to a marker (feedback) being received by the sender. Waclawsky does not disclose delaying the sending of the next packet until the queue occupancy is one.

Li et al. ('Li' hereinafter) discloses a method aimed at congestion control where when a designated threshold of the average queue size (queue occupancy) is exceeded (queue occupancy is greater than 1) there is a reduction in the transmission rate/speed (delay) and congestion window (disclosed in Col 4 line 51- Col 5 line25).

Therefore it would have been obvious to one of the ordinary skill in the art at the time if the invention to enhance the efficient method of sending data packets from end to end using queuing and time samples as disclosed by Waclawsky, with the congestion control method disclosed by Li, in order to achieve a more efficient means of controlling the congestion (Li Col 1 lines 7-11).

Claim 6 Waclawsky fails to discloses counting lost packets, inferring and updating the available queue occupancy, considering the lost packets when predicting the queue occupancy and using the available queue occupancy to determine a speed of congestion control.

Li et al. Discloses within a TCP, acknowledging that a data packet is lost (counting individually) by resetting its current window (updating queue occupancy) and threshold,

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and reducing the sending speed of packets (Col 9 lines 60- Col 10 line15). The motivation is the same as that for claim 2.

Claim 7      Waclawsky discloses computing a next window's worth of data packets (predicting queue occupancy), but does not disclose predicting packet loss and informing an encoder.

Li discloses informing a source node (encoder) of congestion and packet loss through an acknowledgment packet. Li discloses retransmitting a packet lost via the source node (disclosed in Col 4 line 51- Col 5 line 13).

The motivation is the same as that for claim 2. Another motivation for enhancing Waclawsky's invention with Li's is to better deal with packet loss.

Claim 10      Waclawsky discloses sending a marker (transport data) from the destination node to the sender node to indicate that a packet has been received (Col 1 line 60- Col 2 line12). Waclawsky does not disclose sending application feedback.

Li discloses informing a source node (feedback) of congestion and packet loss through an acknowledgment packet (application feedback) (disclosed in Col 4 line 51- Col 5 line 13). The motivation is the same as that for claim 2.

Claim 11      Waclawsky discloses sending a marker (transport data) from the destination node to the sender node to indicate that a packet has been received (Col 1 line 60- Col 2 line12). Waclawsky does not disclose reducing the number of feedback messages when the queue occupancy is within a predetermined error measure.

Li discloses sending an acknowledgement packet (feedback) to the sender when the average of the queue size (queue occupancy) exceeds a designated threshold

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(error measure). When the average of the queue size does not exceed the threshold there is no need for the acknowledgement packet, therefore reducing the feedback sent to the sender (disclosed in Col 4 line 51- Col 5 line 25). The motivation is the same as that for claim 2.

4. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waclawsky et al. (US 5226041) in view of Srinivasan (US 5991812)

Claim 3 Waclawsky does not disclose the predicting using a multi- timescale linear prediction method.

Srinivasan discloses an invention implemented in various ways, including a method and system that discloses the transmission of data packets applying queuing. The method/ system provides a plurality of queues and applies a queue selection method to select a queue and packet to be output. The method/ system discloses a queue time that is a continuous piece-wise linear function whose slope changes as the bandwidth (queue occupancy) changes (Col 7 lines 12-24).

Therefore it would have been obvious to one of the ordinary skill in the art at the time if the invention to enhance the efficient method of sending data packets from end to end using queuing and time samples as disclosed by Waclawsky, with the queue selection method disclosed by Srinivasan. The motivation for this enhancement is to decrease delay and avoid the dropping of packets (disclosed in Srinivasan Col 1 lines 54-65).



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Claim 5      Wacławsky discloses computing a next window's worth of data packets (predicting queue occupancy), but does not disclose subtracting a mean for the time series from each pair of samples to produce a zero-mean time series for the predicting.

Srinivasan discloses a queue time that is a continuous piece-wise linear function whose slope changes as the bandwidth (queue occupancy) changes. Subtracting a mean from the samples applies the concept of finding a standard deviation, which is well known in the art.

The motivation is same as for claim 3.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey  
Examiner  
Art Unit 2667

*C. Grey*

*Chi Pham*  
CHI PHAM  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

*11/29/07*